

[0033] the at least one memory and the computer program code configured to, with the at least one processor, cause the apparatus at least to:

[0034] insert an indication associated with a service requested by the apparatus to an apparatus address field of a wireless service discovery packet; and

[0035] transmit the wireless service discovery packet including the inserted indication associated with the requested service.

[0036] According to an example embodiment of the invention, an apparatus comprises:

[0037] wherein the wireless, service discovery packet is a Bluetooth Low Energy SCAN_REQ PDU packet.

[0038] According to an example embodiment of the invention, an apparatus comprises:

[0039] wherein the apparatus's address field is a non-resolvable private address format in a ScanA field of the Bluetooth Low Energy SCAN_REQ PDU packet.

[0040] According to an example embodiment of the invention, an apparatus comprises:

[0041] at least one processor;

[0042] at least one memory including computer program code;

[0043] the at least one memory and the computer program code configured to, with the at least one processor, cause the apparatus at least to:

[0044] store one or more service identities of services the apparatus has available;

[0045] receive a wireless, service discovery packet including an indication associated with a requested service in a sender's address field; and

[0046] determine whether there is any match of the indication associated with a requested service in the received wireless, service discovery packet, with the stored one or more service identities.

[0047] According to an example embodiment of the invention, an apparatus comprises:

[0048] wherein the wireless, service discovery packet is a Bluetooth Low Energy SCAN_REQ PDU packet.

[0049] According to an example embodiment of the invention, an apparatus comprises:

[0050] wherein the sender's address field is a non-resolvable private address format in a ScanA field of the Bluetooth Low Energy SCAN_REQ PDU packet.

[0051] According to an example embodiment of the invention, an apparatus comprises:

[0052] wherein if there is a match in the publisher, the apparatus considers the match as an indication of need for activation of Wi-Fi NAN for publishing or subscribing purposes.

[0053] According to an example embodiment of the invention, a computer program product comprises computer executable program code recorded on a computer readable non-transitory storage medium, the computer executable program code comprising:

[0054] code for inserting, by an apparatus, an indication associated with a service requested by the apparatus to an apparatus address field of a wireless service discovery packet; and

[0055] code for transmitting, by the apparatus, the wireless service discovery packet including the inserted indication associated with the requested service.

[0056] According to an example embodiment of the invention, a computer program product comprises computer

executable program code recorded on a computer readable non-transitory storage medium, the computer executable program code comprising:

[0057] code for storing, by an apparatus, one or more service identities of services the apparatus has available;

[0058] code for receiving, by the apparatus, a wireless, service discovery packet including an indication associated with a requested service in a sender's address field; and

[0059] code for determining, by the apparatus, whether there is any match of the indication associated with a requested service in the received wireless, service discovery, packet, with the stored one or more service identities.

[0060] The resulting example embodiments enable service discovery in a wireless communications medium.

DESCRIPTION OF THE FIGURES

[0061] FIG. 1 is an example functional block diagram of a Bluetooth Low Energy (LE) wireless device 100 functioning as a scanner, sending a Bluetooth LE SCAN_REQ PDU seeking to discover whether a specified service SID is available from an advertiser 110, in Bluetooth LE active scanning. The Bluetooth LE wireless device 100 assigns the specified SID to the ScanA field of the SCAN_REQ PDU. The non-resolvable private address format in the ScanA field of SCAN_REQ PDU, is set to the SID of the service requested. The Bluetooth LE wireless device 100 then transmits the SCAN_REQ PDU to the Bluetooth LE wireless device 110 functioning as the NAN advertiser. The Bluetooth LE wireless device 110 has previously buffered the SIDs of the services it has available. The Bluetooth LE wireless device 110 analyzes the ScanA field of the received SCAN_REQ PDU and determines whether there is any match with the buffered SIDs, for NAN service discovery, in accordance with at least one embodiment of the present invention.

[0062] FIG. 2A illustrates the example formats of Bluetooth LE advertising channel PDUs.

[0063] FIG. 2B illustrates the example formats of Bluetooth LE connectable undirected and scannable undirected advertising events. Connectable undirected events allow for active scanning and connection requests. Scannable undirected events allow for active scanning, but disallow connection requests.

[0064] FIG. 3: illustrates in an example embodiment of the invention, the use of non-resolvable private address to carry the SID in SCAN_REQ PDUs. In an example embodiment, the non-resolvable private address format is used in the ScanA field of the SCAN_REQ PDUs when the Bluetooth LE active scanning is used for NAN service discovery purposes. The 46 bit random part of the Bluetooth LE non-resolvable address, is set to according to the SID of the service one is either looking for (subscribe) or advertising (publish). Either the 46 least significant bits or the 46 most significant bits of the SID are used as the 46 random bits of the Bluetooth LE non-resolvable private address, in accordance with at least one embodiment of the present invention.

[0065] FIG. 4A is an example flow diagram of operational steps in the Bluetooth LE wireless device 100 functioning as a NAN subscriber, sending a Bluetooth LE SCAN_REQ PDU seeking to discover whether a specified service SID is available from an advertiser 110, in Bluetooth LE active scanning, in accordance with at least one embodiment of the present invention.

[0066] FIG. 4B is an example flow diagram of operational steps in the Bluetooth LE wireless device 110 functioning as